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REPORT
101-216

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ATMOSPHERIC AND SATELLITE PROGRAMS

AUGUST 3, 1989.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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Mr. ROE, from the Committee on Science, Space, and Technology, submitted the following

REPORT

[To accompany H.R. 2427]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 2427) to authorize appropriations for certain atmospheric and satellite programs and functions of the National Oceanic and Atmospheric Administration, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment is as follows:

Strike out all after the enacting clause and insert in lieu thereof the following:

TITLE I—NATIONAL WEATHER SERVICE

SEC. 101. OPERATIONS AND RESEARCH.

(a) There are authorized to be appropriated to the Secretary of Commerce (hereafter in this Act referred to as the "Secretary") to enable the National Oceanic and Atmospheric Administration to carry out the operations and research duties of the National Weather Service, $299,686,000 for fiscal year 1990, $310,406,000 for fiscal year 1991, and $321,090,000 for fiscal year 1992. Such duties include meteorological, hydrological, and oceanographic public warnings and forecasts, as well as applied research in support of such warnings and forecasts, but do not include duties described in section 102.

(b)(1) The Secretary shall direct the Office of the Chief Scientist of the National Oceanic and Atmospheric Administration to establish an advisory committee of tropical cyclone research experts to make recommendations for Atlantic tropical cyclone research activities and Atlantic tropical cyclone reconnaissance procedures.

(2) The Secretary, working jointly with other agencies as appropriate and utilizing the expertise of the advisory committee established under paragraph (1), shall establish a 5-year program for collecting operational and reconnaissance data, conducting research, and analyzing data on Atlantic tropical cyclones to assist the forecast and

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warning program and increase the understanding of the causes and behavior of Atlantic tropical cyclones.

(3) Within 120 days after the date of enactment of this Act, the Secretary shall develop and submit to the Congress a management plan for the program established under paragraph (2) which shall include organizational structure, goals, major tasks, and funding profiles for the 5 year duration of the program.

(c) Of the sums authorized under subsection (a) of this section, $250,000 for fiscal year 1990, $500,000 for fiscal year 1991, and $250,000 for fiscal year 1992 are authorized to be appropriated for the purposes of implementing subsection (b) of this section.

(d) Of the sums authorized under subsection (a) of this section, $5,000,000 for fiscal year 1990, $4,000,000 for fiscal year 1991, and $3,000,000 for fiscal year 1992 are authorized to be appropriated for the Stormscale Operational and Research Meteorology (STORM) program.

SEC. 102. SYSTEMS ACQUISITION.

There are authorized to be appropriated to the Secretary to enable the National Oceanic and Atmospheric Administration to carry out the public warning and forecast systems duties of the National Weather Service, $125,117,000 for fiscal year 1990, $132,100,000 for fiscal year 1991, and $113,100,000 for fiscal year 1992. Such duties include the development, acquisition, and implementation of major public warning and forecast systems.

SEC. 103. WEATHER SERVICE MODERNIZATION.

(a) The Secretary shall prepare and submit to Congress before October 1, 1989, a National Implementation Plan for the modernization of the National Weather Service. The National Implementation Plan shall include—

(1) an overall schedule for modernization;

(2) detailed requirements for new technologies, facilities, staffing levels, and funding during the next two fiscal years beginning after the date of such submission, in accordance with the overall schedule for modernization;

(3) detailed plans and schedules for facility site procurement and preparation in accordance with the overall schedule for modernization;

(4) special measures to test, evaluate, and demonstrate key elements of the modernized National Weather Service operations before national implementation, including a multistation operational demonstration which tests the performance of all components of the modernization in an integrated manner for a sustained period; and

(5) detailed plans and funding requirements for meteorological research described in title II of this Act to assure that new techniques in forecasting will be developed to utilize the new technologies being implemented in the modernization.

(b) The Secretary shall submit a revised National Implementation Plan to the Congress before the beginning of each successive fiscal year, after consultation, as appropriate, with other Federal and public agencies responsible for providing or utilizing weather services.

(c) The Secretary shall include as part of the National Implementation Plan for fiscal year 1991 a description of the resources needed to conduct a demonstration of modernized weather forecasting technologies at a site in the northeastern United States. The description shall include a schedule for completion of the demonstration, estimates for necessary equipment and personnel, and an assessment of the value of conducting such a demonstration.

SEC. 104. CLOSURE, AUTOMATION, OR RELOCATION OF FIELD OFFICES.

(a) The Secretary shall not close, consolidate, automate, or relocate any National Weather Service Office or National Weather Service Forecast Office unless the Secretary has certified to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate that such action will not result in any degradation of weather services provided to the affected area. Such certification shall include—

(1) a detailed comparison of services provided to the affected area and the services to be provided after such action;

(2) any recent or expected modernization of National Weather Service operations which will enhance services in the affected area; and

(3) evidence, based upon operational demonstration of modernized National Weather Service operations, which supports the conclusion that no degradation in services will result from such action.

(b) The Secretary shall not close, consolidate, automate, or relocate any National Weather Service Office or National Weather Service Forecast Office located at an airport unless the Secretary first conducts an air safety appraisal to determine the effect of such action on aircraft safety, and includes in the certification required under subsection (a) a certification that such action will not result in a decrease in aircraft safety.

(c) The Secretary shall not close, consolidate, automate, or relocate any National Weather Service Office which is the only office in a State, unless the Secretary first evaluates the effect on weather services provided to in-State users, such as State agencies, civil defense officials, and local public safety offices, and includes in the certification required under subsection (a) a certification that a comparable level of weather services provided to such in-State users will remain.

TITLE II—ATMOSPHERIC RESEARCH

SEC. 201. CLIMATE AND AIR QUALITY RESEARCH.

(a) There are authorized to be appropriated to the Secretary to enable the National Oceanic and Atmospheric Administration to carry out its climate and air quality research duties, $61,347,000 for fiscal year 1990, $74,762,000 for fiscal year 1991, and $83,481,000 for fiscal year 1992. Such duties include interannual and seasonal climate research, long-term climate and air quality research, and the National Climate Program.

(b) Of the sums authorized under subsection (a) of this section, $6,000,000 for fiscal year 1990, $8,000,000 for fiscal year 1991, and $6,000,000 for fiscal year 1992 are authorized to be appropriated for the implementation of a nationwide climate services system and applied climatology program.

(c) Of the sums authorized under subsection (a) of this section, $3,100,000 for fiscal year 1990, $3,700,000 for fiscal year 1991, and $3,700,000 for fiscal year 1992 are authorized to be appropriated for the activities of the National Climate Program and the Regional Climate Centers.

SEC. 202. ATMOSPHERIC PROGRAMS.

(a) There are authorized to be appropriated to the Secretary to enable the National Oceanic and Atmospheric Administration to carry out its atmospheric research duties, $46,328,000 for fiscal year 1990, $48,172,000 for fiscal year 1991, and $49,521,000 for fiscal year 1992. Such duties include research for developing improved prediction capabilities for atmospheric processes, as well as solar-terrestrial services and research.

(b) Of the sums authorized under subsection (a) of this section, $250,000 for fiscal year 1990, $250,000 for fiscal year 1991, and $150,000 for fiscal year 1992 are authorized to be appropriated for tornado and severe thunderstorm weather research activities in the southeastern coastal plain region of the United States.

SEC. 203. CLIMATE SERVICES SYSTEM MODERNIZATION.

(a) The Secretary shall direct the Office of the Chief Scientist of the National Oceanic and Atmospheric Administration to prepare and submit to Congress, not later than one year after the date of enactment of this Act, a plan for the implementation of a nationwide climate services system and applied climatology program. Such plan shall include detailed requirements and schedules for the improvement of (1) the timeliness of climate services, (2) the spatial coverage of weather observational networks, (3) the quality control of climate data, (4) access to climate data, (5) the use of climate data, (6) the coordination of Regional Climate Centers with Federal climate centers, and (7) private sector participation in providing climate services.

(b) Of the sums authorized under section 201(a), $200,000 are authorized to be appropriated for fiscal year 1990 for the purposes of implementing subsection (a) of this section.

TITLE III—NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

SEC. 301. SATELLITE OBSERVING SYSTEMS.

(a) There are authorized to be appropriated to the Secretary to enable the National Oceanic and Atmospheric Administration to carry out its satellite observing systems duties $300,297,000 for fiscal year 1990, $324,055,000 for fiscal year 1991, and $241,789,000 for fiscal year 1992. Such duties include spacecraft procurement, launch, and associated ground station system changes involving polar orbiting and geostationary environmental satellites and land remote sensing satellites, as well as the operation of such satellites.

(b) The authorization provided for under subsection (a) of this section shall be in addition to funds authorized under the Land Remote-Sensing Commercialization Act of 1984 (15 U.S.C. 4201 et seq.) for the purpose of carrying out such duties relating to satellite observing systems.

(c) Of the sums authorized under subsection (a) of this section, $350,000 for fiscal year 1990, $250,000 for fiscal year 1991, and $250,000 for fiscal year 1992 are authorized to be appropriated for geologic sea surface research and basic geological remote sensing for energy resources at the Cooperative Institute for Applied Remote Sensing.

SEC. 302. ENVIRONMENTAL DATA MANAGEMENT.

There are authorized to be appropriated to the Secretary to enable the National Oceanic and Atmospheric Administration to fund those duties relating to data and information services, $30,000,000 for fiscal year 1990, $31,200,000 for fiscal year 1991, and $32,448,000 for fiscal year 1992. Such duties include climate data services, ocean data services, geophysical data services, and environmental assessment and information services.

TITLE IV—AGRICULTURAL WEATHER INFORMATION

SEC. 401. SHORT TITLE.

This title may be cited as the "National Agricultural Weather Information System Act of 1989".

SEC. 402. FINDINGS AND PURPOSES.

(a) FINDINGS.—Congress finds that—

(1) a major cause of variability and losses in agricultural production is weather and climate factors;

(2) extreme weather conditions, such as drought, appear to be occurring more frequently, and further climate changes are likely;

(3) the Federal Government has repeatedly assumed responsibility for emergency aid to agricultural producers who suffer losses due to weather;

(4) it would be prudent and cost effective to prevent or reduce agricultural losses due to weather factors through better use of weather and climate information;

(5) current agricultural weather and climate information and its delivery to agricultural producers are not adequate; and

(6) better application of weather and climate information will help conserve water resources, allow agricultural chemicals to be applied in a more efficient fashion with less stress on the environment, and reduce energy consumption by improved management decision making.

(b) PURPOSES.—The purposes of this Act are to—

(1) provide a nationally coordinated agricultural weather information system, based on the participation of universities, State programs, Federal agencies, and the private weather consulting sector, and aimed at meeting the weather and climate information needs of agricultural producers;

(2) facilitate the collection, organization, and dissemination of advisory weather and climate information relevant to agricultural producers, through the participation of the private sector and otherwise;

(3) provide for research and education on agricultural weather and climate information, aimed at improving the quality and quantity of weather and climate information available to agricultural producers, including research on short-term forecasts of thunderstorms and on extended weather forecasting techniques and models;

(4) encourage, where feasible, greater private sector participation in providing agricultural weather and climate information, to encourage private sector participation in educating and training farmers and others in the proper utilization of agricultural weather and climate information, and to strengthen their ability to provide site-specific weather forecasting for farmers and the agricultural sector in general; and

(5) ensure that the weather and climate databases needed by the agricultural sector are of the highest scientific accuracy and thoroughly documented, and that such databases are easily accessible for remote computer access.

SEC. 403. AGRICULTURAL WEATHER OFFICE.

(a) ESTABLISHMENT OF THE OFFICE AND ADMINISTRATION OF THE SYSTEM.—The Secretary of Agricultural shall establish in the Department of Agriculture an Agricultural Weather Office to plan and administer the National Agricultural Weather In-

formation System. The System shall be comprised of the Office established under this section and the activities of the State agricultural weather information systems described in section 406(b)(1).

(b) AUTHORITY.—The Secretary, acting through the Office, may—

(1) enter into cooperative projects with the National Weather Service, for support of operational weather forecasting and observation useful in agriculture, for joint workshops to train agriculturalists about the optimum utilization of agricultural weather and climate data, for joint development of improved computer models and computing capacity, and for efforts to enhance the quality and availability of weather and climate information needed by agriculturalists;

(2) obtain standardized weather observation data collected in near real time through State agricultural weather information systems;

(3) provide, through the Cooperative State Research Service, competitive grants under section 405 for research in atmospheric sciences and climatology;

(4) provide grants to eligible States under section 406 to plan and administer State agricultural weather information systems;

(5) coordinate the activities of the Office with the weather and climate research activities of the Cooperative State Research Service, the National Academy of Sciences, the National Science Foundation Atmospheric Services Program, and the National Climate Program;

(6) encourage private sector participation in the National Agricultural Weather Information System through mutually beneficial cooperation with the private sector, particularly in generating weather and climate data useful for site-specific agricultural weather forecasting; and

(7) represent the Department of Agriculture on agrometeorology and climate matters with the World Meteorological Organization, the Intergovernmental Program on Climate Change, and relevant science and technology agreements.

(c) APPOINTMENT OF DIRECTOR.—The Secretary shall appoint a Director to manage the activities of the Agricultural Weather Office and to advise the Secretary on scientific and programmatic coordination for climate, weather, and remote sensing.

SEC. 404. NATIONAL ADVISORY BOARD ON AGRICULTURAL WEATHER.

(a) ADVISORY BOARD.—

(1) The Secretary of Agriculture shall establish the Advisory Board on Agricultural Weather to advise the Director of the Agricultural Weather Office with respect to carrying out this title.

(2) The Board shall have nine members, appointed by the Secretary in consultation with the Director of the National Weather Service, of which two members shall be from each of the four Cooperative Extension Service Regions. Of the two members from each region, one shall be an agricultural producer and one shall be an agricultural or atmospheric scientist. At least two members of the Board shall be appointed from among individuals who are engaged in providing private meteorology services or consulting with a private meteorology firm.

(3) The Board shall elect a chairperson from among its members.

(4) Each Board member shall be appointed for a three year term, except that to ensure that members of the Board serve staggered terms, the Secretary shall appoint three of the original members of the Board to appointments for one year, and three of the original members to appointments for two years.

(5) The Board shall meet not less than twice annually.

(6) Members of the Board shall serve without compensation, but while away from their homes or regular places of business in the performance of services for the Board, members of the Board shall be allowed travel expenses, including a per diem allowance in lieu of subsistence, in the same manner as individuals employed in Government service are allowed travel expenses under section 5703 of title 5, United States Code.

(b) FEDERAL ADVISORY COMMITTEE ACT.—Section 14(a)(2) of the Federal Advisory Committee Act (5 U.S.C. App. 2 section 14(a)(2)) shall not apply with respect to the Board.

SEC. 405. COMPETITIVE GRANTS PROGRAM.

(a) GRANTS.—With funds allocated to carry out this section, the Secretary of Agriculture may make grants, on a competitive basis, to State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations and corporations, and individuals to carry out research in all aspects of atmospheric sciences and climatology that can be shown to be important in both a basic and developmental way to understanding, forecasting, and delivering agricultural weather information.

(b) PRIORITY.—In selecting among applications for grants under subsection (a), the Secretary shall give priority to proposals which emphasize—

(1) techniques and processes that relate to weather-induced agricultural losses, and to improving the advisory information on weather extremes such as drought, floods, freezes, and storms well in advance of their actual occurrence;

(2) improvement of site-specific weather data collection and forecasting; or

(3) impact of weather on economic and environmental costs in agricultural production.

SEC. 406. STATE AGRICULTURAL WEATHER INFORMATION SYSTEMS.

(a) GRANTS.—

(1) With funds allocated to carry out this section, the Secretary of Agriculture shall make grants to not fewer than 10 eligible States to plan and administer, in cooperation with the Director of the Agricultural Weather Office, the Administrator of the Cooperative Extension Service, the Administrator of the Cooperative State Research Service, and others as appropriate (such as the directors of the appropriate State agricultural erxperiment stations and State extension programs), advisory programs for State agricultural weather information systems.

(2) For purposes of selecting among applications submitted by States for such grants, the Secretary shall take into consideration the recommendation of the Advisory Board on Agricultural Weather and consult with the Director.

(b) ELIGIBILITY TO RECEIVE GRANTS.—To be eligible to receive a grant under subsection (a), the chief executive officer of a State shall submit to the Secretary an application that contains—

(1) assurances that the State will expend such grant to plan and administer a State agricultural weather system that will—

(A) collect observational weather data throughout the State and provide such data to the National Weather Service and the Agricultural Weather Office;

(B) develop methods for packaging information received from the National System for use by agricultural producers (with State extension services and the private sector to serve as the primary conduit of agricultural weather forecasts and climatic information to producers); and

(C) develop programs to educate agricultural producers on how to best use weather and climate information to improve management decisions; and

(2) other assurances and information as the Secretary may require by rule.

SEC. 407. FUNDING.

(a) ALLOCATION OF FUNDS.—Not less than 15 percent and not more than 25 percent of the funds appropriated for a fiscal year to carry out this title shall be used for cooperative work with the National Weather Service entered into under section 403(b)(1). Not less than 15 percent and not more than 25 percent of the funds shall be used by the Cooperative State Research Program for a competitive grants program under section 405. Not less than 25 percent and not more than 35 percent of the funds shall be divided equally between the participating States under section 406. The remaining funds shall be allocated for use by the Agricultural Weather Office and the Cooperative Extension Service in carrying out generally the provisions of this title.

(b) LIMITATIONS ON USE OF FUNDS.—Funds provided under the authority of this title shall not be used for the construction of facilities. Each State or agency receiving funds shall not use more than 30 percent of such funds for equipment purchases. Any use of the funds in facilitating the distribution of agricultural and climate information to producers shall be done with consideration for the role that the private meteorological sector can plan in such information delivery.

(c) AUTHORIZATION OF APPROPRIATIONS.—There is hereby authorized to be appropriated $5,000,000 for each of the fiscal years 1990, 1991, and 1992 to carry out this title.

COMMITTEE REPORT

August 2, 1989

H.R. 2427, National Oceanic and Atmospheric Administration Authorization for FY 1990, 1991, and 1992

I. PURPOSE OF THE BILL

The purpose of the bill is to reauthorize appropriations for fiscal years 1990, 1991, and 1992 for the atmospheric, weather, satellite, and environmental data programs of the National Oceanic and Atmospheric Administration.

II. COMMITTEE ACTIONS

The Subcommittee on Natural Resources, Agriculture Research and Environment has held five days of hearings on the atmospheric, weather, satellite and environmental data programs of the National Oceanic and Atmospheric Administration.

On April 4, 1989, the Subcommittee held hearings on the fiscal year 1990 NOAA budget request for atmospheric and satellite programs. NOAA officials testified concerning the adequacy of the Administration's FY 1990 budget request in enabling NOAA to fulfill its Congressionally mandated missions; the appropriate role and level of support for NOAA research and development programs; the status and plans for the modernization of the weather services; the status and plans for Landsat and satellite remote-sensing; and the problems, budget shortfalls, and plans for data programs at NOAA. In addition, the Subcommittee held several hearings relating to specific aspects of NOAA's activities.

On March 3, 1989, the Subcommittee held a hearing on Tornado Forecasting and Severe Storm Warnings in Raleigh, North Carolina. The hearing focused on the ineffectiveness of the National Weather Service in providing tornado warnings during the severe storms and tornadoes of November 27-28, 1988, and identified new technologies to improve the capabilities of the National Weather Service. During the severe storms and tornado of November 27-28, 1988, National Weather Service offices in North Carolina did not provide advance warnings to the public, and no tornado watch was issued prior to the initial tornado. The radar at the Raleigh-Durham weather office was out of service from November 20, 1988 to November 29, 1988, due to the lack of spare parts and spare part modification kits. The NWS internal investigation concluded that the event illustrated the "* * * compelling, almost desperate, need to upgrade and replace the nation's aged system of weather radars." Testimony was heard from the Deputy Director of the National Weather Service, the Director of the National Severe Storms Forecast Center, the Meteorologist in Charge at the Raleigh-Durham Weather Service Office, the Mayor of Raleigh and other local officials, local television meteorologists, and professors of meteorology from North Carolina State University and the University of North Carolina at Asheville.

On March 7, 1989, the Subcommittee held a hearing on the Proposed Termination of Landsat 4 and Landsat 5. The hearing examined the scheduled termination of the Landsat 4 and Landsat 5

remote-sensing satellites due to the lack of funding to support operational expenses. During the hearing it was announced that the Vice President, who also serves as Chairman of the National Space Council, had secured funding commitments sufficient to keep the satellites operating for a few more months, pending a Landsat policy review to be conducted by the National Space Council. Testimony was heard from the Assistant Administrator for Satellite and Information Service, National Oceanic and Atmospheric Administration; the Deputy Assistant Secretary of Defense for Command, Control, Communications, and Intelligence, Department of Defense; the Director of the U.S. Geological Survey, Department of Interior; and the Chairman of the World Agriculture Outlook Board, Department of Agriculture. In addition, the Subcommittee heard from a wide range of public and private-sector users of the Landsat system; and representatives of the corporate entity designated to commercialize Landsat.

On April 7, 1989, the Subcommittee held a hearing on Hurricane Forecasting and Reconnaissance in West Palm Beach, Florida. The hearing examined the hurricane forecast and reconnaissance programs of the National Weather Service and the status of the hurricane aircraft reconnaissance program operated by the U.S. Air Force. Testimony was heard from the Director of the National Hurricane Center; the Deputy Assistant Administrator of the National Environmental Satellite, Data, and Information Service, National Oceanic and Atmospheric Administration; the Air Weather Services of the U.S. Air Force; private-sector meteorologists, and professors of meteorology.

On May 9, 1989, the Subcommittee on Natural Resources, Agriculture Research and Environment and the Subcommittee on International Scientific Cooperation held a hearing on the Future of Landsat Commercialization. The hearing examined the long-term future of U.S. civil remote-sensing; recent studies of the commercial viability of the Landsat system; and the pros and cons of possible bilateral and multilateral consortia in space remote-sensing. Testimony was heard from representatives of the French, Soviet and Japanese remote-sensing systems; representatives of the NOAA Landsat Marketing study contractors; and other expert witnesses from the private-sector and academia.

On May 11, 1988, the Subcommittee on Natural Resources, Agriculture Research and Environmental approved, by unanimous voice vote, a subcommittee print, as amended, authorizing appropriations for the satellite, weather, and atmospheric programs of the National Oceanic and Atmospheric Administration for fiscal years 1990, 1991 and 1992, and ordered that a clean bill be introduced and reported to the full Committee for further consideration. A clean bill, H.R. 2427, was introduced on May 18, 1989.

On July 26, 1989, the Committee on Science, Space, and Technology approved H.R. 2427, with amendments, by unanimous voice vote, and ordered the bill reported to the full House of Representatives.

III. BACKGROUND AND NEED FOR THE LEGISLATION

The National Oceanic and Atmospheric Administration (NOAA) was created in 1970 by Executive Order of the President through Reorganization Plan #4. Since its establishment, NOAA has obtained most of its funding for its major programs through direct appropriation with little or no legislative authorization. Authorizations that did occur were limited to a few specific areas of interest such as the National Climate Program and marine pollution monitoring and research. In the 98th Congress, legislation authorizing NOAA activities, S. 1097, was vetoed by the President on October 19, 1984. In the 99th Congress, the Consolidated Omnibus Budget Reconciliation Act of 1986 (P.L. 99–272) authorized various NOAA activities, including nautical and aeronautical chart programs, marine research and monitoring, ocean pollution research, and weather modification research. During the 100th Congress, provisions authorizing appropriations for NOAA's satellite, atmospheric, and weather programs (previously approved by the House of Representatives and the Senate as S. 1667) were included in Title IV of S. 2209, the National Aeronautics and Space Administration Authorization Act for Fiscal Year 1989, which was signed into law on November 17, 1988 (P.L. 100–685).

The need to proceed with a comprehensive multi-year authorization bill is particularly important in view of NOAA's plans to acquire major new systems to modernize and improve its weather and satellite services, and to study important phenomena such as global climate change.

A. National Weather Service

NOAA's National Weather Service (NWS) is responsible for weather forecasts and severe weather services such as hurricane, tornado, and flash flood warnings and alerts. The National Weather Service is also responsible for climate forecasts, agriculture weather and fire weather services, as well as marine forecasts and marine severe weather warnings.

Under the guidance of the Committee on Science, Space, and Technology, the Nationl Weather Service has been begun several major procurements to modernize its equipment. These major systems acquisitions include (1) a nationwide network of 160 new Doppler radar (NEXRAD) systems; (2) over 1,000 automated weather observation stations (ASOS); (3) a set of high speed supercomputers to tie all these sources of information together with (4), a new data processing, communication, and meteorologist work station display system (AWIPS).

NEXRAD, the Next Generation Radar system, is a state-of-the-art Doppler radar system which will replace the aged and obsolete radar systems currently used to provide warnings and forecasts of severe weather and precipitation. Nationwide implementation of the NEXRAD system will increases tornado warning lead times from the current average of 1–2 minutes to 20–30 minutes.

The Automated Surface Observing System (ASOS) was designed to provide reliable 24-hour per day, continuous surface weather observations. It will replace the current costly and time-consuming

manual system of obtaining surface observations of temperature, pressure, wind speed and direction, humidity, cloud cover and precipitation.

The Central Computer Facility of the National Oceanic and Atmospheric Administration will begin acquisition of a Class VII supercomputer system in 1990, resulting in more accurate and specific forecasts of major storms, including hurricanes, severe thunderstorms, winter storms, and floods, as well as more accurate general weather forecasts in the medium (3–10 day) and extended (30 day) range.

The Advanced Weather Interactive Processing System (AWIPS), the very nerve center of a modernized weather service, will provide the forecaster with all available weather data including satellite observations, surface observations, Doppler radar data, radiosondes and other information. This system will integrate satellite and radar data for the first time and provide to the local forecaster the same capability that has been shown to significantly improve the forecasts of the National Severe Storms Forecast Center.

B. Oceanic and Atmospheric Research

The Office of Oceanic and Atmospheric Research (OAR) conducts most of the research in support of NOAA's service organizations. The Committee authorizes the weather, climate, air quality, and solar terrestrial research and service programs that are carried out by the Office of Oceanic and Atmospheric Research. Major programmatic activities of OAR include climate research and forecasting, basic tornado and hurricane research, weather forecast model research and development, ozone depletion research, climate and global change monitoring and research, and remote sensing development.

C. National Environmental Satellite, Data, and Information Services

The National Environmental Satellite, Data, and Information Service (NESDIS) is responsible for providing operational satellite services for NOAA and the Nation. NESDIS procures, operates and maintains the spacecraft and ground system components to two weather satellite systems, and geostationary satellite system and the polar-orbiting satellite system. The geostationary system provides near-continuous observations of the Earth's western hemisphere to suport the provisions of weather warnings, forecasts and other applications. The polar-orbiting system obtains global environmental data such as measurements of the vertical temperature of the atmosphere, sea surface temperatures, cloud motion and winds. The polar satellites also provide a relay function for global emergency signals from aircraft and ships in distress.

The National Environmental Satellite, Data, and Information Services is responsible for the operation of the land remote-sensing satellites (Landsat 4 and Landsat 5) and the implementation of the Landsat Commercialization program. Landsats 4 and 5 are operating beyond their designed lifetime, but continue to provide data to users through EOSAT, the private company selected to commer-

cialize the Landsat system. The Landsat 6 satellite, to be launched in 1991, and its ground system will be operated by EOSAT.

NESDIS is also responsible for archiving environmental data, from satellites and other sources, and making the data available to users. Oceanic, geophysical, and climatic data are archived at three facilities, the National Oceanic Data Center in Washington, D.C., the National Geophysical Data Center in Boulder, Colorado, and the National Climatic Data Center in Asheville, North Carolina.

IV. SECTION-BY-SECTION ANALYSIS

The paragraphs that follow provide a section-by-section description of the bill, and explanation of the Committee's intent for the section. A summary of the appropriations authorized by the bill is as follows:

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

[In thousands of dollars]

	Fiscal year—		
	1990	1991	1992
National Weather Service			
Operations and Research:			
Local warnings and forecasts	260,000	270,000	281,216
Central forecast guidance	30,042	31,033	31,902
Atmospheric and hydrological research	9,644	8,973	7,792
Subtotal—operations	299,686	310,406	321,090
Systems Acquisition:			
NEXRAD	86,267	81,600	62,600
ASOS	12,900	16,700	16,700
AWIPS	18,150	26,000	26,000
Class VII Supercomputer	7,800	7,800	7,800
Subtotal—system acquisition	125,117	132,100	113,100
National Weather Service—total	424,803	442,506	434,190
National Environmental Satellite, Data, and Information Service			
Satellite Observing Systems:			
Polar Orbiting System	21,533	109,975	125,793
Geostationary System	170,900	100,000	60,000
Landsat Operations	20,000	20,000	.....
Landsat Commercialization	36,900	36,500	.....
Environmental Observing Services	48,964	50,580	51,996
NOAA-port	2,000	7,000	4,000
Subtotal—Satellite	300,297	324,055	241,789
Environmental Data Management System: Data and Information Services	30,000	31,200	32,448
Total—Nesdis	330,297	355,255	274,237
Office of Oceanic and Atmospheric Research			
Climate and Air Quality Research:			
Interannual and Seasonal Climate	13,397	15,397	13,397
Long Term Climate and Air Quality	24,845	25,665	26,384
Climate and Global Change	20,005	30,000	40,000
National Climate Program	3,100	3,700	3,700
Subtotal	61,347	74,762	83,481

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION—Continued

[In thousands of dollars]

	Fiscal year—		
	1990	1991	1992
Atmospheric Programs:			
Weather research	41,862	43,559	44,779
Solar-Terrestrial Services	4,466	4,613	4,742
Subtotal	46,328	48,172	49,521
Oar subtotal (SS&T Jurisdiction)	107,675	122,934	133,022
Grand Total—National Oceanic and Atmospheric Administration (SS&T Jurisdiction)	862,775	920,695	841,429

TITLE I—NATIONAL WEATHER SERVICE

Section 101. Operations and research

This section authorizes appropriations of $299,686,000 in fiscal year 1990; $310,406,000 in fiscal year 1991; and $321,090,000 in fiscal year 1992; to the Secretary of Commerce to enable the National Oceanic and Atmospheric Administration (NOAA) to carry out the operations and research duties of the National Weather Service. The section includes among these duties meteorological, hydrological, and oceanogrpahic public warnings and forecasts, as well as applied research.

Section 101(b)(1) establishes a tropical cyclone advisory committee to make recommendations to improve Atlantic hurricane research activities and Atlantic hurricane reconnaissance procedures. Section 101(b)(2) and 101(b)(3) directs the Secretary of Commerce to establish a 5-year program of tropical cyclone research to assist the hurricane forecast and warning system, utilizing the expertise of the advisory committee; and to submit a management plan for the program to Congress within 120 days after enactment.

Section 101(c) authorizes appropriations of $250,000 in fiscal year 1990; $500,000 in fiscal year 1991; and $250,000 in fiscal year 1992; for the activities of the tropical cyclone advisory committee.

Section 101(d) authorizes appropriations of $5,000,000 in fiscal year 1990; $4,000,000 in fiscal year 1991; and $3,000,000 in fiscal year 1992; for the Stormscale Operational Research Meteorology (STORM) program of severe storm research designed to improve forecasts and warnings of severe weather.

Section 102. Systems acquisition

Section 102 authorizes appropriation of $125,117,000 for fiscal year 1990; $132,100,000 in fiscal year 1991; and $113,000,000 in fiscal year 1992; to the Secretary of Commerce to enable NOAA to carry out its public warning and forecast systems duties under law. The section includes among these duties the development, acquisition, and implementation of major public warning and forecast systems.

Section 103. Weather Service modernization

This section replaces provisions in current law (Section 407 of P.L. 100-685) which directs the Secretary of Commerce to prepare and submit to Congress a National Implementation Plan for the Modernization of the National Weather Service. Section 103 includes the provisions in current law, but also requires that the National Implementation Plan include detailed plans and schedules for facility site procurement and preparation in accordance with the overall schedule for modernization.

Section 103(a) directs the Secretary of Commerce (the Secretary) to prepare and submit to the Congress before October 1, 1989, a National Implementation Plan for Modernization of the National Weather Service. Specifies that the National Implementation Plan shall include (1) an overall schedule for modernization; (2) detailed requirements for new technologies, staffing levels, and funding requirements; (3) detailed plans for facility site procurement and preparation; (4) special measures to test, evaluate, and demonstrate key elements of the modernized system; and, (5) detailed plans and funding requirements for meteorological research activities to assure that new techniques in forecasting will be incorporated in the modernized system.

Section 103(b) directs the Secretary of Commerce to submit to Congress, at the beginning of each successive fiscal year, a revised National Implementation Plan, after consultation, as appropriate, with other Federal and public agencies.

Section 103(c) directs the Secretary to include, as a part of the National Implementation Plan, a description of the resources needed to conduct a demonstration of modernized weather forecasting technologies at a site in the northeastern United States, and an assessment of the value of conducting such a demonstration.

Section 104. Closure, automation, or relocation of field offices

This section replaces the certification provisions in current law (Section 408 of P.L. 100-685) prohibiting the closure, consolidation, automation, or relocation of weather offices unless the Secretary of Commerce certifies that such action will not result in any degradation of weather services provided to the affected area. Section 104 includes all the certification requirements in current law, but also includes additional limitations on the closure, consolidation, automation, or relocation of weather offices at airports and in States with only one weather office as specified in sections 104(b) and 104(c) explained below.

The restrictions in section 104 regarding the Secretary's authority "to automate" weather offices is not intended to restrict the use of modern technology at weather offices, but only to prohibit the substantial or complete reduction of personnel and replacement with machinery operating in a manner essentially independent of external control.

Section 104(a) prohibits the Secretary from closing, consolidating, automating, or relocating any Weather Service Office or Weather Service Forecast Office unless the Secretary has certified to specified congressional committees that the action will not result in any degradation of weather services provided to the affected area. The

section specifies the criteria which must be included in such certification.

Section 104(b) prohibits the Secretary from closing, consolidating, automating, or relocating any Weather Service Office or Weather Service Forecast Office located at an airport unless an air safety appraisal is conducted and the Secretary certifies that such action will not result in a decrease in aircraft safety.

Section 104(c) prohibits the Secretary from closing, consolidating, automating, or relocating any Weather Service Office or Weather Service Forecast Office which is the only office in a State unless the Secretary has first evaluated its effect and certified that a comparable level of weather services will continue to be provided to such in-State users.

TITLE II—ATMOSPHERIC RESEARCH

Section 201. Climate and air quality research

Section 201(a) authorizes appropriations of $61,347,000 for fiscal year 1990; $74,762,000 for fiscal year 1991; and $83,481,000 for fiscal year 1992 to the Secretary of Commerce to enable NOAA to carry out its climate and air quality research duties. The section specifies that such duties include interannual and seasonal climate research, long-term climate and air quality research, and the National Climate Program.

Section 201(b) authorizes appropriations of $6,000,000 for fiscal year 1990; $8,000,000 in 1991; and $6,000,000 in 1992 for the implementation of a nationwide climate service system and applied climatology program.

Section 201(c) authorizes appropriations of $3,100,000 in fiscal year 1990; $3,700,000 in fiscal year 1991; and $3,700,000 in fiscal year 1992 for the activities of the National Climate Program and the Regional Climate Centers.

Section 202. Atmospheric Programs

Section 202(a) authorizes appropriations of $46,328,000 for fiscal year 1990; $48,172,000 for fiscal year 1991; and $49,521,000 for fiscal year 1992 to the Secretary of Commerce to enable NOAA to carry out its atmospheric research duties. The section specifies that such duties include research to develop improved prediction capabilities for atmospheric processes, as well as solar-terrestrial services and research.

Section 202(b) authorizes appropriations of $250,000 in fiscal year 1990; $25,000 for fiscal year 1991; and $150,000 in fiscal year 1992 for tornado and severe thunderstorm weather research in the southeastern coastal plain region of the United States.

Section 203. Climate services system modernization

Section 203(a) directs the Secretary of Commerce to instruct the Chief Scientist of the National Oceanic and Atmospheric Administration to prepare and submit to Congress, not later than one year after enactment, a plan for a nationwide climate services system and applied technology program with detailed requirements and schedules for the improvement of climate services. The section specifies that the plan shall include plans for the improvement of

the timeliness of climate service, the spatial coverage of weather observational networks, the quality control of climate data, the coordination of Regional Climate Centers with federal climate centers, and private sector participation in providing climate services.

Section 203(b) authorizes appropriations of $200,000 for fiscal year 1990 for the preparation of the climate services system modernization plan.

TITLE III—NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

Section 301. Satellite observing systems

Section 301(a) authorizes appropriations of $300,297,000 for fiscal year 1990; $324,055,000 for fiscal year 1991; and $241,789,000 for fiscal year 1992 to the Secretary of Commerce to enable the National Oceanic and Atmopheric Administration to carry out its satellite observing systems duties. Includes among these duties spacecraft procurement, launch, and associated ground station system changes involving polar-orbiting and geostationary environmental satellites and land remote-sensing satellites, as well as the operation of these satellites.

Section 301(b) specifies that this authorization is in addition to funds already authorized in the Land Remote-Sensing Commercialization Act of 1984.

Section 301(c) authorizes appropriations of $350,000 for fiscal year 1990; $250,000 for fiscal year 1991; and $250,000 for fiscal year 1992 for geologic sea surface research and basic remote sensing for energy resources at the Cooperative Institute for Applied Remote Sensing. This research program will attempt to document the correlations between sea surface signatures, surface oil seeps, and geologic features on the sea bottom to demonstrate the ability of remote sensing for energy exploration and other purposes.

Section 302. Environmental data management

Section 302 authorizes appropriations of $30,000,000 for fiscal year 1990; $31,200,000 for fiscal year 1991; and $32,448,000 for fiscal year 1992 to the Secretary of Commerce to enable the National Oceanic and Atmospheric Administration to carry out its data and information services duties. Such duties include climate data services, ocean data services, geophysical data services, and environmental assessment and information services.

TITLE IV—AGRICULTURE WEATHER INFORMATION

Title IV will authorize a National Agricultural Weather Information System as a Department of Agriculture program. This information system would be operated out of a new Agricultural Weather Office at the Department of Agriculture, with the office being advised by a nine member board of agricultural producers, scientists, and consulting meteorologists drawn from across the U.S. The information system would involve cooperation and coordination between the relevant Department of Agriculture agencies, the National Weather Service, universities, state departments of agriculture, state and regional climate programs, and the private sector. The Agricultural Weather Office would not only coordinate the in-

formation system, but would also enter into joint projects with the National Weather Service, issue grants to states for state weather programs, and distribute research and education grants on a competitive, peer-reviewed basis.

Section 401. Short title

Section 401 provides that title IV may be cited as the "National Agricultural Weather Information System Act of 1989".

Section 402. Findings and purposes

Section 402, in subsection (a), contains findings of Congress, under which Congress finds that—

(1) a major cause of variability and losses in agricultural production is weather and climate factors;

(2) extreme weather conditions, such as drought, appear to be occurring more frequently, and further climate changes are likely;

(3) the Federal Government has repeatedly assumed responsibility for emergency aid to agricultural producers who suffer losses due to weather;

(4) it would be prudent and cost effective to prevent or reduce agricultural losses due to weather factors through better use of weather and climate information; and,

(5) current agricultural weather and climate information and its delivery to agricultural producers are not adequate.

(6) better application of weather and climate information will help conserve water resources, allow agricultural chemicals to be applied in a more efficient fashion with less stress on the environment, and reduce energy consumption by improved management decision making.

Section 402, in subsection (b), states that the purposes of title IV are to—

(1) provide a nationally coordinated agricultural weather information system, based on the participation of universities, State programs, Federal agencies, and the private weather consulting sector, and aimed at meeting the weather and climate information needs of agricultural producers;

(2) facilitate the collection, organization, and dissemination of advisory weather and climate information relevant to agricultural producers, through the participation of the private sector and otherwise;

(3) provide for research and education on agricultural weather and climate information, aimed at improving the quality and quantity of weather and climate information available to agricultural producers, including research on short-term forecasts of thunderstorms and on extended weather forecasting techniques and models;

(4) encourage, where feasible, greater private sector participation in providing agricultrual weather and climate information, to encourage private sector participation in educating and training farmers and others in the proper utilization of agricultural weather and climate information, and to strengthen their ability to provide site-specific weather forecasting for farmers and the agricultural sector in general.

(5) ensure that the weather and climate databases needed by the agricultural sector are of the highest scientific accuracy and thoroughly documented, and that such databases are easily accessible for remote computer access.

Section 403. Agricultural Weather Office

Section 403, in subsection (a), will require the Secretary of Agriculture to establish in the Department of Agriculture an Agricultural Weather Office to plan and administer that National Agricultural Weather Information System. The System is to be comprised of (1) the Office, and (2) the activities of the State agricultural weather information systems (see analysis of subsection (b) of 406 below).

Section 403, in subsection (b), will give the Agricultural Weather Office specific authorizations to act. It provides that the Secretary of Agriculture, acting through the Office, will be authorized to—

(1) enter into cooperative projects with the National Weather Service, for support of operational weather forecasting and observation useful in agriculture (this mention of operation forecasting capability is in regard to the activities of NWS, and their efforts to provide information useful to agriculture, with the assistance of the Office, and is not intended to imply that USDA will develop a major forecasting service), for joint workshops to train agriculturalists about the optimum utilization of agricultural weather and climate data, for joint development of improved computer models and computing capacity, and for efforts to enhance the quality and availability of weather and climate information needed by agriculturalists;

(2) obtain standardized weather observation data collected in near real time through State Agricultural weather information systems;

(3) provide, through the Cooperative State Research Service, competitive grants under Section 405 for research in atmospheric sciences and climatology;

(4) provide grants to eligible States under Section 406 to plan and administer State agricultural weather information systems;

(5) coordinate the activities of the Office with the weather and climate research activities of the Cooperative State Research Service, the National Academy of Sciences, the National Sciences Foundation Atmospheric Services Program, and the National Climate Program;

(6) encourage private sector participation in the National Agricultural Weather Information System through mutually beneficial cooperation with the private sector, particularly in generating weather and climatic data useful for site-specific agricultural weather forecasting; and

(7) represent the Department of Agriculture on agrometeorology and climate matters with the World Meteorological Organization, the Intergovernmental Program on Climate Change, and relevant science and technology agreements.

Section 403, in subsection (c), will require the Secretary of Agriculture to appoint a Director to manage the activities of the Office.

Section 404. National Advisory Board on Agricultural Weather

Section 404, in subsection (a), will require the Secretary of Agriculture to establish a National Advisory Board on Agricultural Weather to advise the director of the Agricultural Weather Office with respect to carrying out title IV.

Section 404, in subsection (b), contains provisions relating to appointment of members to the Board. Specifically, it provides that the Board will have nine members, to be appointed by the Secretary of Agriculture in consultation with the National Weather Service. To provide geographic representation, the four Cooperative Extension Service regions shall be used to identify four areas of the country from which to draw board members. Two members of the board shall come from each region, with one as an agricultural producer, and one as an agricultural or atmospheric scientist. At least two members of the nine member board shall be appointed from among individuals who are engaged in providing private meteorological services or consulting with a private meteorology firm. At least one of the two or more private sector representatives will need to be an agricultural producer or a scientist from one of the four regions, in order to limit the Board to nine members.

Subsection (a) will require the Board to elect a chair from its members.

Subsection (a) will require that each member of the Board be appointed for a three year term, except to ensure that members of the Board serve staggered terms, the Secretary shall appoint three of the original members of the Board to appointments for one year, and three of the original members to appointments for two years.

Subsection (a) will require the Board to meet not less than twice annually.

Section 404, in subsection (a), provides that members of the Board shall serve without compensation, but while away from their homes or regular places of business in the performance of services for the Board, members of the Board shall be allowed travel expenses, including a per diem allowance in lieu of subsistence, in the same manner as individuals employed in Government service are allowed travel expenses under section 5703 of title 5, United States Code.

Section 405. Competitive grants program

Section 405, in subsection (a), will authorize the Secretary of Agriculture to make grants, on a competitive, peer-reviewed basis, to State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations and corporations, and individuals to carry out research in all aspects of atmospheric sciences and climatology that can be shown to be important in both a basic and developmental way to understanding, forecasting, and delivering agricultural weather information. At least part of the research funded should involve identifying the weather and climate information needs of agricultural producers and agribusinesses, or methods for communicating such information to producers.

Section 405, in subsection (b), will establish priorities for the selection among applications for grants. The Secretary of Agriculture would be required to give priority to proposals which emphasize—

(1) techniques and processes that relate to weather-induced agricultural losses, and to improving the advisory information on weather extremes such as drought, floods, freezes, and storms well in advance of their actual occurrence;

(2) improvement of site-specific weather data collection and forecasting; or

(3) impact of weather on economic and environmental costs in agricultural production.

Section 406. State agricultural weather information systems

Section 406, in subsection (a), will require the Secretary of Agriculture to make grants to not fewer than 10 eligible States to plan and administer, in cooperation with the Director of the Agricultural Weather Office, the Administrator of the Cooperative Extension Service, the Administrator of the Cooperative State Research Service, and others as appropriate (such as the directors of the appropriate state agricultural experiment stations and state extension programs), advisory programs for State agricultural weather information systems. It is anticipated that, over time, the number of States participating in the National System would increase, and the amount of funding to States which completed their planning would decrease or cease.

Section 406, in subsection (b), provides that to be eligible to receive a grant under section 406, the chief executive officer of a State, or a designated representative of the chief executive officer, shall submit to the Secretary an application that contains assurances that the State will spend such funds in a designated fashion. It is the intent of the Committee that appropriate units within a State, such as the state department of agriculture, state universities, and state climate programs cooperate in preparing such as proposal. It is expected that one of these entities within the State would take a lead role in developing such a proposal, but would do so with the participation of other relevant institutions and programs within the State. It would also be acceptable for adjoining states to submit a regional proposal, provided efforts have been made to solicit the input and cooperation of all relevant parties within that region.

The assurances which will be required in a state or regional proposal are that the state or regional information system will: facilitate and coordinate collection of observational agricultural weather data throughout the State or Region and provide such data to the National Weather Service and the Agricultural Weather Office; develop methods for packaging information received from the National System for use by agricultural producers (with state extension services and the private sector to serve as the primary conduit of agricultural weather forecasts and climatic information to producers); develop programs to educate agricultural producers on how to best use weather and climate information management decisions; and provide other assurances and information as the Secretary may require by rule.

Section 407. Funding

Section 407, in subsection (a), provides that of the funds appropriated for a fiscal year to carry out title IV—

(1) Not less than fifteen percent and not more than twenty-five percent of the funds appropriated for a fiscal year to carry out this Act are to be used for cooperative work with the National Weather Service entered into under Section 403(b)(1).

(2) Not less than fifteen percent and not more than twenty-five percent of the funds are to be used by the Cooperative State Research Program for a competitive grants program under Section 405.

(3) Not less than twenty-five percent and not more than thirty-five percent of the funds are to be divided equally between the participating States under Section 406.

(4) The remaining funds are to be allocated for use by the Agricultural Weather Office and the Cooperative Extension Service in carrying out generally the provisions of this Act.

Section 407, in subsection (b), will prohibit the use of funds provided under the authority of title IV for the construction of facilities. Each State or agency receiving funds would be prohibited from using more than thirty percent of such funds for equipment purchases. Any use of the funds in facilitating the distribution and climate information to producers is to be done with consideration for the role that the private meteorological sector can play in such information delivery.

Section 407, in subsection (c), will authorize to be appropriated $5,000,000 in each of the fiscal years 1990, 1991, and 1992 to carry out title IV.

V. COMMITTEE VIEWS

TITLE I—NATIONAL WEATHER SERVICE

Section 101. National Weather Service operation and research

The budget request for National Weather Service operations for FY 1990 is $220,567,000. The Committee is concerned that the budget request for National Weather Service operations for fiscal year 1990 is unrealistic and, in fact, would result in the closure of a large number of Weather Service Offices and Weather Service Forecast Offices.

In order to prevent the closure of up to 132 weather office, the Committee authorizes $260,000,000 to be appropriated for NWS operations in FY 1990. For fiscal years 1991 and 1992, the Committee authorizes $270,400,000 and $281,216,000 respectively.

The Committee rejects the Administration's proposals to terminate Agriculture Weather Services, Fruit Frost Warning Services, and Fire Weather Services, and has authorized appropriations sufficient to continue and to augment these programs. These services are central to the mission of the National Weather Service and have been since the creation of the Weather Bureau in 1890. In setting forth its duties, Congress provided that the NWS "shall have charge of weather, * * * the display of weather and flood signals for the benefit of agriculture, * * * the display of frost and cold-

wave signals, the distribution of meteorological information of agriculture * * *" (15 U.S.C. 313).

The Committee recommends an increase in funding for Atmospheric and Hydrological Research as shown in the following table:

ATMOSPHERIC AND HYDROLOGICAL RESEARCH

[In thousands of dollars]

	Fiscal year—		
	1990	1991	1992
Budget request	2,394	2,473	2,542
Tropical Cyclone Advisory Committee	+250	+500	+250
Hurricane Tracking Models and Storm Surge Models	+2,000	+2,000	+2,000
STORM Program	+5,000	+4,000	+3,000
Total	9,644	8,973	7,792

Expert witnesses testifying at the April 7, 1989 hearing in Florida on hurricane forecasting and reconnaissance testified that the accuracy of hurricane prediction had not improved since the 1960's. Several reasons were given for this lack of progress including the lack of outside scientific peer review to assess the strengths and weaknesses of research programs and insufficient funding for many of the research programs. The hurricane research and development provisions contained in this legislation addresses these concerns.

The Committee directs the Secretary to establish a standing committee of tropical cyclone research experts who will provide NOAA with independent scientific advice and recommendations to improve its hurricane reconnaissance and hurricane research programs.

The Committee directs the Secretary to develop a 5-year tropical storm research program, drawing on the expertise of the advisory committee and other agencies. The Air Force manages the WC–130 hurricane surveillance aircraft program, and therefore, the Committee expects them to participate in the program.

The plan is to include elements of a 5-year tropical cyclone surveillance research program. The Committee believes that the long-range plan of the Air Force WC–130 hurricane surveillance aircraft should be an integral part of the 5-year program.

The Committee directs that the goal of the 5-year tropical storm research program be to improve the accuracy of hurricane forecasting.

The Committee authorizes a $2,000,000 increase over the Administration's funding request for hurricane tracking model research and storm surge model research. The increase is directed toward improving our understanding of hurricane behavior and its impact on coastal areas.

The Committee supports the implementation of the Stormscale Operational and Research Meteorology (STORM) program and has authorized appropriations to begin this program of severe storm research. The STORM program will engage the research community in the development and use of the new observational and modeling capabilities resulting from the NWS's technology modernization.

An essential part of the STORM program is a closer linkage and two-way information transfer between key segments of the research community and the operational NWS forecast offices. In order to establish that close linkage with the operational offices of the National Weather Service, funding for the STORM program was provided in Title I of the bill rather than Title II. Nevertheless, the Committee expects the agency to closely coordinate research under this program with the related activities authorized under Title II.

The Committee is concerned about the recent closure of several federally contracted weather observation stations including Stampede Pass in Washington, and Blue Canyon and Sexton Summit Oregon. These stations sit astride critical air navigation routes and provide timely weather data to pilots in areas of rapidly shifting weather patterns. Weather information of this type is not only helpful, but also life saving.

In the interest of aviation safety, the Committee therefore urges the Secretary to reopen any federally contracted weather observation station closed between December 30, 1988, and April 1, 1989, as soon as practicable. The hours of operation for such stations should be the same as those on December 29, 1988. After reopening such stations, the Secretary should only close or reduce the hours of operation of such stations pursuant to the provisions of section 104 of this Act. This action would best reduce the risk of additional fatalities by utilizing persons to operate the stations.

Section 102. Systems acquisition

The budget request for NWS systems acquisition for FY 1990 is $107,792,000. In order to proceed expeditiously with the Nationa Weather Service's modernization plan, the Committee authorizes $125,178,000 in FY 1990, $132,100,000 in FY 1991, and $113,100,000 in FY 1992.

The National Weather Service, under the guidance of the Committee on Science, Space, and Technology, has been modernizing its equipment through a series of developments nd procurements. The key component in this modernization effort is the Next Generation Radar system (NEXRAD) which is designed to replace the aged radar systems currently used to provide short-term warnings and forecasts of severe weather and precipitation.

The current radar system has been increasingly troubled by breakdowns, outages, a lack of spare parts, and delay in the delivery of modification kits often needed to enable spare parts to fit outdated and outmoded radar equipment. For example, on November 28, 1988, tornadoes in North Carolina killed four people, injured 157 people, left 982 people homeless, and caused $77 million in damage. The National Weather Service offices in North Carolina did not provide any advance warning of the tornadoes, and no watch was issued prior to the initial tornado. In fact, the Raleigh-Durham radar had been out of service for eight days, due to the lack of spare parts and spare part modification kits, as well as problems with the spare part distribution system.

Further, the Committee is concerned that even if the radar had been fully operative, the equipment is technologically obsolete and could not have provided adequate warning.

The National Weather Service's internal investigation of the incident, the Natural Disaster Survey Report of the North Carolina Tornadoes of November 28, 1988, made a number of recommendations to improve the NWS hazardous weather warning system. The final recommendation in the report concluded:

> Overriding all is a compelling, almost desperate, need to upgrade and replace the nation's aged system of weather radars. These actions must be expedited to prevent another devastating surprise such as we witnessed on November 28, 1988.

The Committee is concerned that the pace to date of the program to implement the NEXRAD system does not reflect the urgency expressed in the November, 1988, Natural Disaster Survey report. In fact, funding designated for the NEXRAD program has been frequently used for reprogramming in order to cover shortfalls in other program areas. It is the view of the Committee that NEXRAD implementation is a critical national priority and should not be delayed by further reprogramming transfers from the NEXRAD program.

The Committee is also concerned that inadequate funding requests for the Advanced Weather Interactive Processing System (AWIPS) may delay the program to the extent that it will be out of phase with the implementation of the other components of the modernized weather system. The Committee considers the Advanced Weather Interactive Processing System, the nerve center for data processing, integration and analysis for weather warning and forecast stations nationwide, a critical priority, and recommends a $15,756,000 increase over the budget request in FY 1990.

TITLE II—ATMOSPHERIC RESEARCH

Section 201. Climate and Air Quality Research

The budget request for Climate and Air Quality Research for FY 1990 is $53,339,000. The Committee recommends an increase to $61,347,000 for fiscal year 1990, $74,762,000 for fiscal year 1991, and $83,481,000 for fiscal year 1992.

The Committee strongly supports NOAA's climate and global change research activities and has approved the budget request of $20,005,000 in fiscal year 1990, $30,000,000 in fiscal year 1991, and an increase to $40,000,000 in fiscal year 1992.

The Committee is concerned that despite the early recognition of the importance of climate information, climate data systems and services have experienced a general deterioration in the past two decades. Federal planning and resources for climate data management and services have failed to keep pace with the growth in volume of data collected by new observing systems. Therefore, the Committee recommends an increase of $6,000,000 in FY 1990, $8,000,000 in FY 1991, and $6,000,000 in FY 1991 in the interannual and seasonal climate budget for the implementation of a nationwide climate services and applied climatology program. The purposes of the program are to improve (1) the timeliness of climate services, (2) the spatial coverage of weather observational networks, (3) the quality control of climate data, (4) access to climate

data, (5) the use of climate data, (6) the coordination of Regional Climate Centers with Federal climate centers, and (7) private sector participation in providing climate services.

Section 202. Atmospheric Programs

The budget request for Atmospheric Programs for fiscal year 1990 is $40,537,000. The Committee recommends an increase of $6,000,000 for weather research activities in fiscal year 1990, to be allocated as follows: $2 million for severe weather research, $2 million for hurricane prediction research, and $2 million for PROFS, the Program for Regional Observing and Forecast Services.

The Committee strongly supports the funding for tornado and severe thunderstorm weather research in the southeastern coastal plain region of the United States. Information compiled by the National Climatic Data Center in Asheville, North Carolina, suggests that the recent storms in North Carolina are part of a general increase in tornadic activity in the Southeast in the past decade. In fact, North Carolina has the dubious distinction of leading the nation in tornado sightings this year, far ahead of both Texas and Oklahoma.

During hearings held over the last several months, it has come to the Committee's attention that there is a pressing need for more information on the unique character of southeastern tornadoes and severe thunderstorms which seem to differ significantly from storm in the Midwest. At the present time, there is no meteorological research being undertaken on tornadic activity in the East, and important differences in the nature of southeastern storms are being ignored.

While the threat from southeastern tornadoes has grown, our understanding of them has not. In recent testimony, the Director of the National Weather Service and the Director of the Severe Storms Forecast Center stressed that current severe storm models are based upon Midwestern weather patterns and often underestimate the severity of smaller storm cells in the Southeast. Both also indicated that better and more extensive research into the dynamics of tornadoes in the southeastern region would dramatically improve our forecasting and detection capabilities, and, more importantly, save lives.

The Committee recommends that these research activities be conducted by the National Oceanic and Atmospheric Administration through a cooperative research program established with a consortium of southeastern universities with qualified atmospheric science research capabilities.

TITLE III—NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

Section 301. Satellite Observing Systems

The budget request for Satellite Observing Systems is $243,394,000 for fiscal year 1990, a decrease of $106,316,000 from the amount appropriated for fiscal year 1989. While the Committee reluctantly accepts the FY 1990 budget request of $21,533,000 for the polar orbiting satellite program, an increase of $34,903,000 is recommended for the geostationary (GOES) satellite system. The

Committee also authorizes an increase of $2,000,000 for the NOAA-PORT program for fiscal year 1990 and funding for the operation of Landsat 4 and Landsat 5.

The Committee believes that the nation can no longer afford the annual ritual of agony over funding for the Landsat program. The Committee therefore commends the commitment of the National Space Council to maintain operations of Landsat 4 and Landsat 5, and to insure the continuity of land remote-sensing data to meet civil needs beyond Landsat 6. The Committee expects that future funding requests will reflect that commitment.

The Committee authorizes $20,000,000 for FY 1990, and $20,000,000 for FY 1991 for Landsat operations; and $36,900,000 for FY 1990 and $36,500,000 for FY 1991 for the Landsat Commercialization program.

During its review of the FY 1990 NOAA authorization request, the Committee was again confronted with a funding crisis for the Landsat program. With a long history of budget cuts and program shutdowns, the Landsat program has become a textbook example of how not to commercialize space. This country's commitment to its civilian remote sensing system has been called into question by both potential customers and competitors. Indeed our international competitors have made the U.S.'s inability to guarantee data continuity a major portion of their marketing presentations.

As this Committee has noted repeatedly, Landsat is an important national resource. It is not only critical to our national security but is also an essential tool in industry and managing the environment.

In its hearings on the Landsat Commercialization effort, the Committee reiterated that the United States must make a firm commitment to this program. The goal of commercialization is not served by the government's reneging on contractual commitments and budgetary support for the commercial entity EOSAT, or by actions which undercut the long term viability of the commercialization program. The clear message to the commercial sector from the EOSAT experience is that the U.S. Government is an unreliable partner.

The Committee is gratified that the National Space Council has undertaken a review of the Landsat program. Through its intervention, the Council was able to provide a stable funding profile for Landsats 4 and 5. The Space Council is now engaged in a review of the follow-ons to Landsat 6. It is hoped that this analysis will consider both technological and management options that are driven by commercial considerations, as well as long range issues affecting space policy. Although an international joint venture (either bilateral or multilateral) may at some point be appropriate, the Committee stresses that this option should be employed only after the U.S. has developed a stable long-term program. We should negotiate with future international partners from a position of strength, not weakness. Moreover, any agreement should maintain the current U.S. technical leadership in space craft development.

In view of the strong interest in the Landsat Commercialization Program within the Committee, the National Space Council is requested to report to the Committee by October 1, 1989, with results of this review, including the overall policy toward continuation of

Land Remote Sensing, a detailed implementation plan, and a funding profile and management structure for Landsats 7 and 8.

The Committee notes that the Administration has failed to meet Congressional requests for similar reports over the past several years. The Committee views this failure primarily as a failure in accountability for policymaking. Therefore, the Committee welcomes the initiatives undertaken by the National Space Council and looks forward to the clarity in policy decisions that the National Space Council can bring through executive communication with the Congress.

The Committee is strongly supportive of the National Oceanic and Atmospheric Administration's program of Cooperative Institutes for Applied Remote Sensing. Under this program it was understood that NOAA would provide a limited amount of funding for basic research so that these institutes could work with private industry and academia in conducting research activities in support of NOAA's missions.

Although the National Oceanic and Atmospheric Administration signed a memorandum of agreement with the University of Oklahoma in 1986 to establish the Cooperative Institute for Applied Remote Sensing, it has not heretofore provided sufficient support of the activities to be carried out by the institute.

The National Oceanic and Atmospheric Adminstration has recognized the value and high quality of previous applied remote sensing research conducted at the Cooperative Institute for Applied Remote Sensing at the University of Oklahoma; therefore, the Committee directs that funding be forthcoming for geologic sea surface research, basic and applied research in geologic remote sensing for energy resources, and applications development.

Section 302. Environmental Data Management

The budget request for Environmental Data Management is $20,715,000 for fiscal year 1990. The authorization for these programs is $30,000,000 for fiscal year 1990, $31,200,000 for fiscal year 1991, and $32,448,000 for fiscal year 1992. The increases are authorized to enable NOAA to alleviate its data archival problems.

The Committee is concerned that data management activities in NOAA are not keeping pace with the expanding requirements presented by new data collection systems such as GOES–NEXT and NEXRAD, and by new research initiatives such as the climate and global change program. The Committee intends that NOAA should meet its data management responsibilities and has included additional funding authorization for this purpose.

TITLE IV—AGRICULTURE WEATHER INFORMATION

The Committeee on Agriculture has examined the language of title IV twice previously, during consideration of H.R. 5015 and H.R. 5056 during the 100th Congress. In each case the Committee on Agriculture voted without dissent to add the title IV language as amendments to those bills. Both H.R. 5015 and H.R. 5056 were approved by the House of Representatives during the 100th Congress.

It is the view of the Committee on Science, Space, and Technology that the National Agricultural Weather Information System to be authorized by title IV would be of great benefit to American agriculture, and would complement current activities of the National Weather Service, the National Oceanic and Atmospheric Administration, and the Department of Agriculture.

Agricultural producers have frequently had to contend with the production difficulties caused by weather extremes. These difficulties are exacerbated by the lack of agricultural weather information available to producers. This problem was recognized in 1955, when the Senate passed a resolution calling on the Secretaries of Agriculture and Commerce to cooperate in identifying the agricultural community's weather information needs. In 1977, the Secretary of Agriculture sent a letter to the Secretary of Commerce that stated "* * * more data and information are needed on a [localized] scale that is directed to the specific short-run information needs of farmers * * * over the longer run, improved climatological data forecasts provide tremendous potential for increasing the efficiency of agricultural production and reducing risk associated with weather."

More timely and comprehensive weather information can help producers increase the efficiency of their farm operations in many ways. Choice of crops or varieties, timing of planting, and planting techniques are early season decisions that can be optimized with better information. As the cropping season progresses, applications of pesticides, and side applications of fertilizers may be modified, so that the most economically efficient rate is applied. This increased efficiency of application can also be extremely important in reducing the potential for water quality problems, by avoiding excess application of agrichemicals. Decisions during crop harvesting can also be improved by better weather information. Livestock producers can benefit as well, reducing animal losses due to extreme weather, and more effectively managing grazing of rangelands or production of forages and feedgrains. Long term decisions about buildings and other capital expenditures often involve evaluation of climate databases, which could be upgraded for agricultural needs.

Hearings on Agricultural Weather Services were held jointly by the House Subcommittee on Department Operations, Research and Foreign Agriculture, and the Subcommittee on Natural Resources, Agricultural Research, and Environment Subcommittee, on June 27 and 28, 1984. There were several witnesses from producer groups, and also extension and private sector representatives. There was consistent support for the importance of federal involvement in agricultural weather programs, and the high benefit/cost ratio on investment in agricultural weather. A similar hearing on May 3, 1989, confirmed the continued need for a stronger federal emphasis in coordinating weather information for agricultural needs (this latter hearing was held by the Subcommittee on Department Operations, Research and Foreign Agriculture.)

One critical problem with agricultural weather right now is that research that has been done is not being fully utilized to improve agricultural weather forecasting. According to Dr. Michael Fritsch of Pennsylvania State University, most of the summer rainfall of

importance to agriculture occurs from clusters of thunderstorms identified by satellite images. These large warm season systems are mostly noncturnal and are responsible for almost all of the severe weather occurring at mid-latitudes, yet these systems are not forecast by currently employed techniques. However, Pennsylvania State University has computer models which will successfully forecast these systems of agricultural importance: the models merely wait adoption.

Seed money is needed to get states, universities, and private sector all working together. This activity requires a national office which can play a coordinating and catalytic role. Currently there is only a small program on agricultural weather forecasting at the National Weather Service (NWS), and no focused effort at the USDA.

There is a strong need for this vital investment in agriculture, particularly since agricultural is such a pivotal part of the national economy. The role of weather in American agriculture was dramatized by the extensive crop and livestock losses due to drought in 1988, leading to Congressional intervention to the order of $4 billion in drought relief payments. Similar drought payments to farmers in 1989 were expected to be at least $1 billion. A nationally focused, modestly-funded effort is needed to improve farm management and reduce these tremendous losses.

The purpose of title IV is to implement the policy Congress passed in the 1985 Food Security Act (P.L. 99–198, Sec. 1762), which stated "* * * it is in the public interest to maintain an active Federal involvement in providing agricultural and silvicultural weather and climate information. * * *" Specifically, this title is intended to: reduce agricultural losses from extreme weather conditions through better farm management decisions, by coordinating and facilitating the involvement of universities, state climate offices, state departments of agriculture, NOAA programs, USDA agencies, and the private sector in developing and providing agricultural weather information; and to provide for research and education on agricultural weather and climate, aimed at improving the quality and quantity of weather and climate information available to agricultural producers and agribusinesses.

An additional purpose, and one of particular importance in these times of increasing concern about agricultural effects on the environment is to improve pest management and the efficiency of on-farm use of agricultural chemical through better weather forecasting. Better forecasts will also improve the efficiency of irrigation water use, reducing the strain on water supplies of dryer regions.

This program is meant to compliment and not replace the functions of NWS in this area. It is recognized that NWS is the most logical repository of national weather and climate data. Funding provided for cooperative projects between USDA and NWS could be used for a number of different activities related to the overall goal of developing a nationally coordinated information system focusing on agricultural weather and climate information. It is expected that the NWS functions will be enhanced by the development of a focused effort on agricultural weather and climate research and information dissemination at USDA.

The private agricultural weather sector should benefit from this legislation, due to the intent of increasing the quality of agricultural weather data, both from state weather and climate systems and through a more focused cooperation between the USDA and NWS. With improved agricultural weather information available, private firms will be able to develop even better information packaging and forecasting for their agricultural customers.

Other responsibilities which the Agricultural Weather Office is intended to carry out include: ensuring that weather and climate data are accessible in a format usable by research modelers; ascertaining the adequacy of current weather and climate databases for agricultural needs; encouraging states to provide some degree of matching monies in regard to grants funding state or regional weather information systems; facilitating the use of remote sensing data as appropriate to the goals of the System; encouraging intergovernmental exchange programs which would bring appropriate experts into the Office on a temporary basis; using, to the extent possible, rapidly improving microcomputer computer hardware and software technology rather than mainframe computers, given the gigabytes of storage capacity and virtual memory capability available with today's microcomputers, and the relative ease of use, lower cost, and greater accessibility of such computer technologies compared to more traditional mainframe computers; and, working closely with the programs of the Joint Agricultural Weather Facility.

VI. OVERSIGHT FINDINGS AND RECOMMENDATIONS

Pursuant to Rule XI, Clause 2(l)(3), of the Rules of the House of Representatives, and under the authority of rule X, clause 2(b)(1), and clause 3(f), the results and findings of oversight activities considered by the Committee on Science, Space, and Technology have been adopted and are incorporated in the recommendations found in the present bill and report.

VII. CONGRESSIONAL BUDGET ACT INFORMATION

This bill provides new authorization rather than new budget authority and consequently the provision for section 308(a) of the Congressional Budget Act of 1974 are not applicable.

VIII. CONGRESSIONAL BUDGET OFFICE COST ESTIMATES

Pursuant to section 403 of the Congressional Budget Act of 1974, and Rule XI, 2(l)(3) of the Rules of the House of Representatives, the report of the Congressional Budget Office follows:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, July 31, 1989.

HON. ROBERT A. ROE,
Chairman, Committee on Science, Space, and Technology,
U.S. House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 2427, a bill to authorize appropriations for certain atmospheric and satellite programs and

functions of the National Oceanic and Atmospheric Administration.

If you wish further details on this estimate, we will be pleased to provide them.

Sincerely,

ROBERT D. REISCHAUER, *Director.*

CONGRESSIONAL BUDGET OFFICE, COST ESTIMATE

1. Bill number: H.R. 2427.

2. Bill title: A bill to authorize appropriations for certain atmospheric and satellite programs and functions of the National Oceanic and Atmospheric Administration.

3. Bill status: As ordered reported by the House Committee on Science, Space, and Technology, July 26, 1989.

4. Bill purpose: H.R. 2427 would authorize appropriations totaling $869 million, $921 million, and $842 million for fiscal years 1990, 1991, and 1992, respectively, to the National Oceanic and Atmospheric Administration (NOAA) for atmospheric and satellite programs. The bill would also authorize the appropriation of $5 million annually for fiscal years 1990 through 1993 to the Department of Agriculture to establish an Agricultural Weather Office.

5. Estimated cost to the Federal Government:

[By fiscal year, in millions of dollars]

	1990	1991	1992	1993	1994
NOAA:					
Authorization level	863	921	841	.....	.....
Estimated outlays	587	842	846	274	61
Department of Agriculture:					
Authorization level	5	5	5	.....	.....
Estimated outlays	4	5	5	1	.....
Total:					
Estimated authorization level	868	926	846	.....	.....
Estimated outlays	591	847	851	275	61

The costs of this bill would be in budget functions 300 and 350.

Basis of estimate: This estimate assumes that the full amounts authorized would be appropriated for each fiscal year. The estimated outlays are based on historical spending patterns.

6. Estimated cost to State and local governments: None.

7. Estimate comparison: None.

8. Previous CBO estimate: None.

9. Estimate prepared by: Michael Sieverts and Andrew Morton (226–2860).

10. Estimate approved by: C.G. Nuckols (for James L. Blum, Assistant Director for Budget Analysis.)

IX. OVERSIGHT FINDINGS AND RECOMMENDATIONS, COMMITTEE ON GOVERNMENT OPERATIONS

No findings or recommendations on oversight activity pursuant to rule X, clause 2(b)(2), and rule XI, clause (2)(l)(3)(D), of the Rules

of the House of Representatives have been submitted by the Committee on Government Operations for inclusion in this report.

X. EFFECT OF LEGISLATION ON INFLATION

In accordance with rule XI, clause 2(l)(4) of the Rules of the House of Representatives, this legislation is assessed to have no inflationary effect on prices and costs in the operation of the national economy.

XI. COMMITTEE RECOMMENDATION

A quorum being present, the Committee favorably reported the bill, H.R. 2427, as amended, by voice vote, and recommends its enactment.

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